How Compact, Electric Cities Improve Energy Security

Institute for Transportation & Development Policy

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ITDP Institute for Transportation & Development Policy

UC DAVIS UNIVERSITY OF CALIFORNIA

FIA FOUNDATION

A Few Reminders

This session will be about 60 minutes and will be recorded to share @ITDP_HQ on YouTube afterwards.

The chat box is available for comments, but please submit questions for our speakers using the Q&A function.



Share your thoughts with ITDP and the FIA Foundation on social media **@ITDP_HQ @FIAFdn**

Visit itdp.org/publications to access the full report.

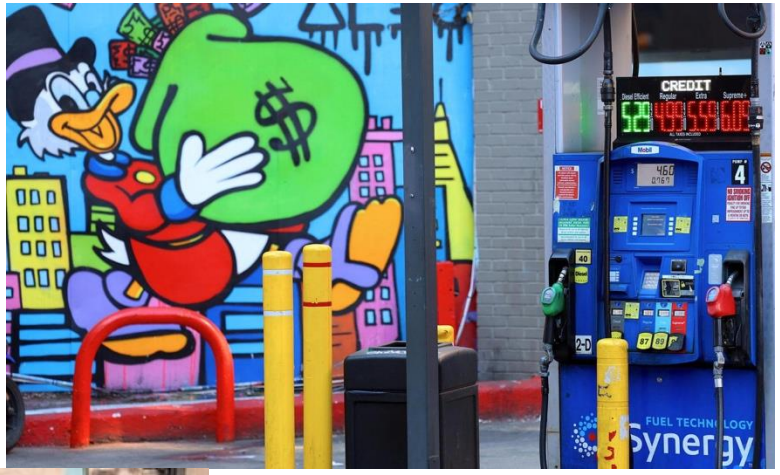
Why Study This?

60% increase in oil price during the current war in Iran

Leading to severe economic and social impacts:

- Foreign currency depletion
- Power shortages
- Fuel shortages
- School closures
- Mandated four-day workweeks
- Inflation

Cars and 2-wheelers consume 60% of transport energy, 95% of that coming from oil and gas.



Source: Responsible Statecraft, 2026



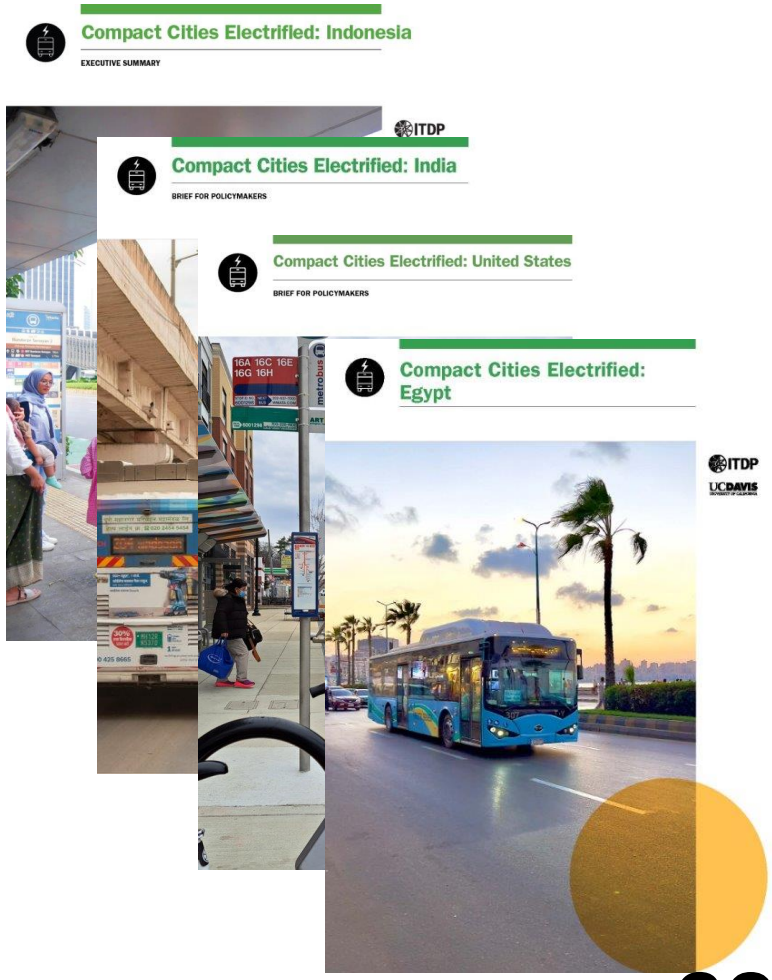
Source: The Guardian, 2026

Background

Find these reports at ITDP.org/Publications

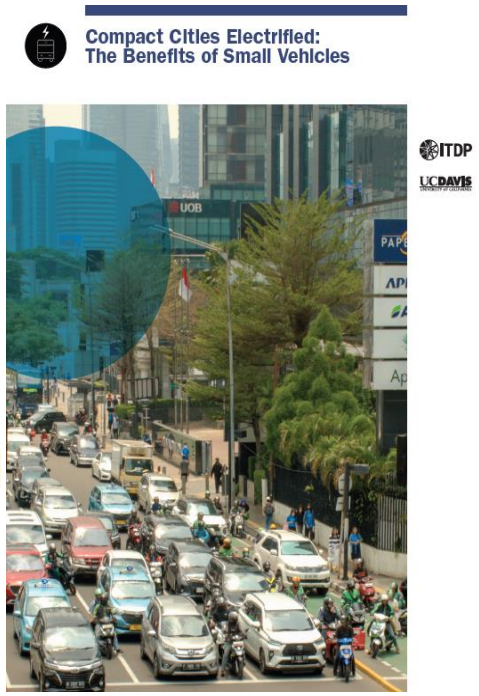


2021





2023



2025

Methodology

Two scenarios examined:

1) Business as Usual (BAU): current level of import and energy usage maintained

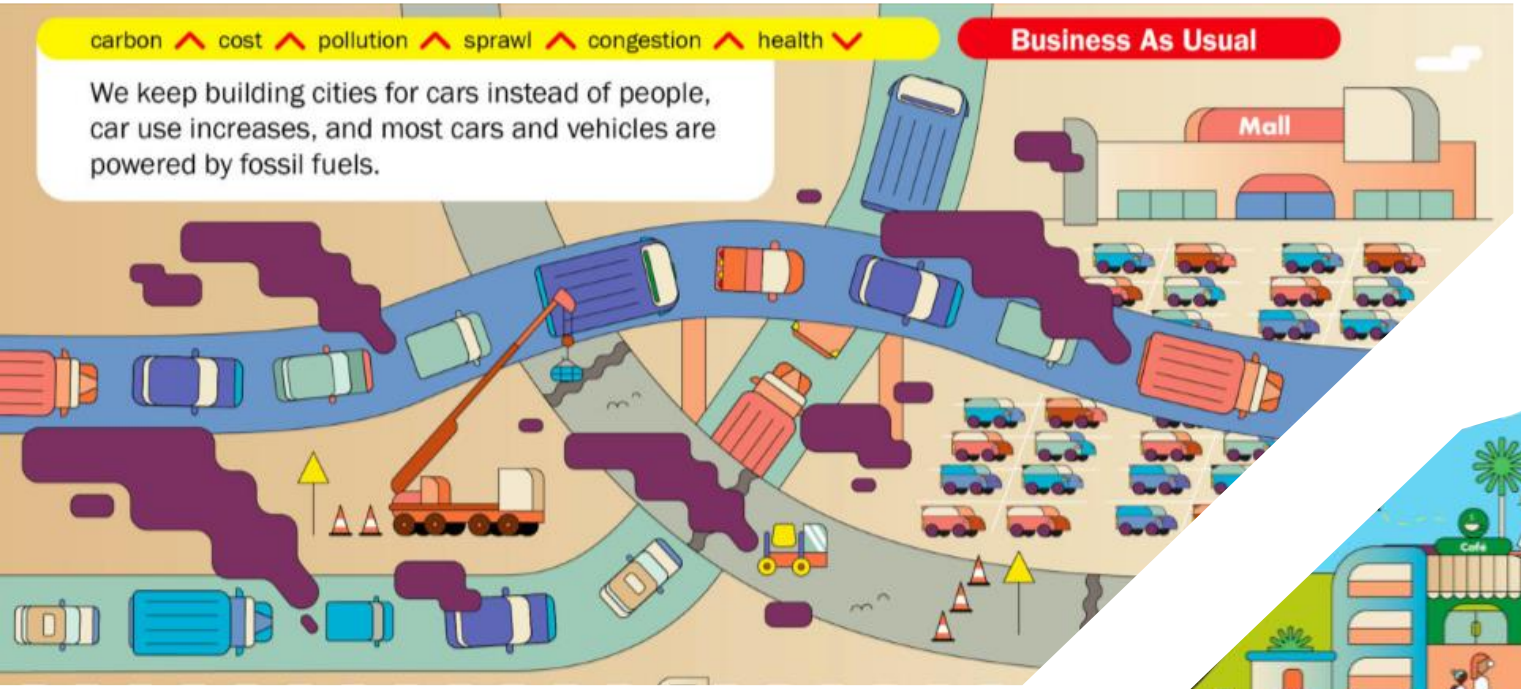


2) Shift + EV

Mode Shift: Increased walking, cycling, and public transport.

High EV: Rapid vehicle electrification.

High Electrification





Methodology

Base data modeling is centered around the ASIF methodology:

1. **Activity**: Travel per capita.

2. **Structure**: The share of modes used (in turn, a function of vehicle sales and stocks by mode and technology type).

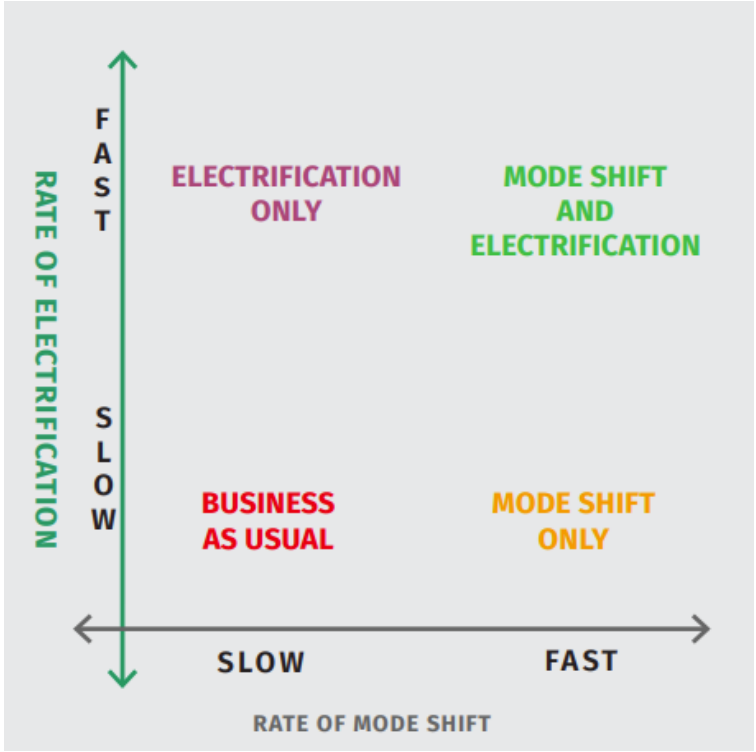
3. **Intensity**: The efficiency of modes, measured as fuel use per kilometer.

4. **Fuel**: The carbon intensity of the fuels and energy carriers used by different types of vehicles, measured in carbon emissions per unit of fuel.

Methodology

Energy import projections:

- Uses IEA's country and regional oil product, crude oil, and natural gas data for: Brazil, China, India, Indonesia, Mexico, and the United States
- BAU assumes oil and gas production and consumption (outside of urban transport) remains at 2025 levels through 2050
- Projections for change in urban transport oil and gas demand used from prior CCSE modeling efforts
- Examines energy-consumption impacts for each country in each scenario



Smarter Mobility Strengthens Energy Security

2035 and 2050 Projected Percent Change in Gross Oil and Gas Imports

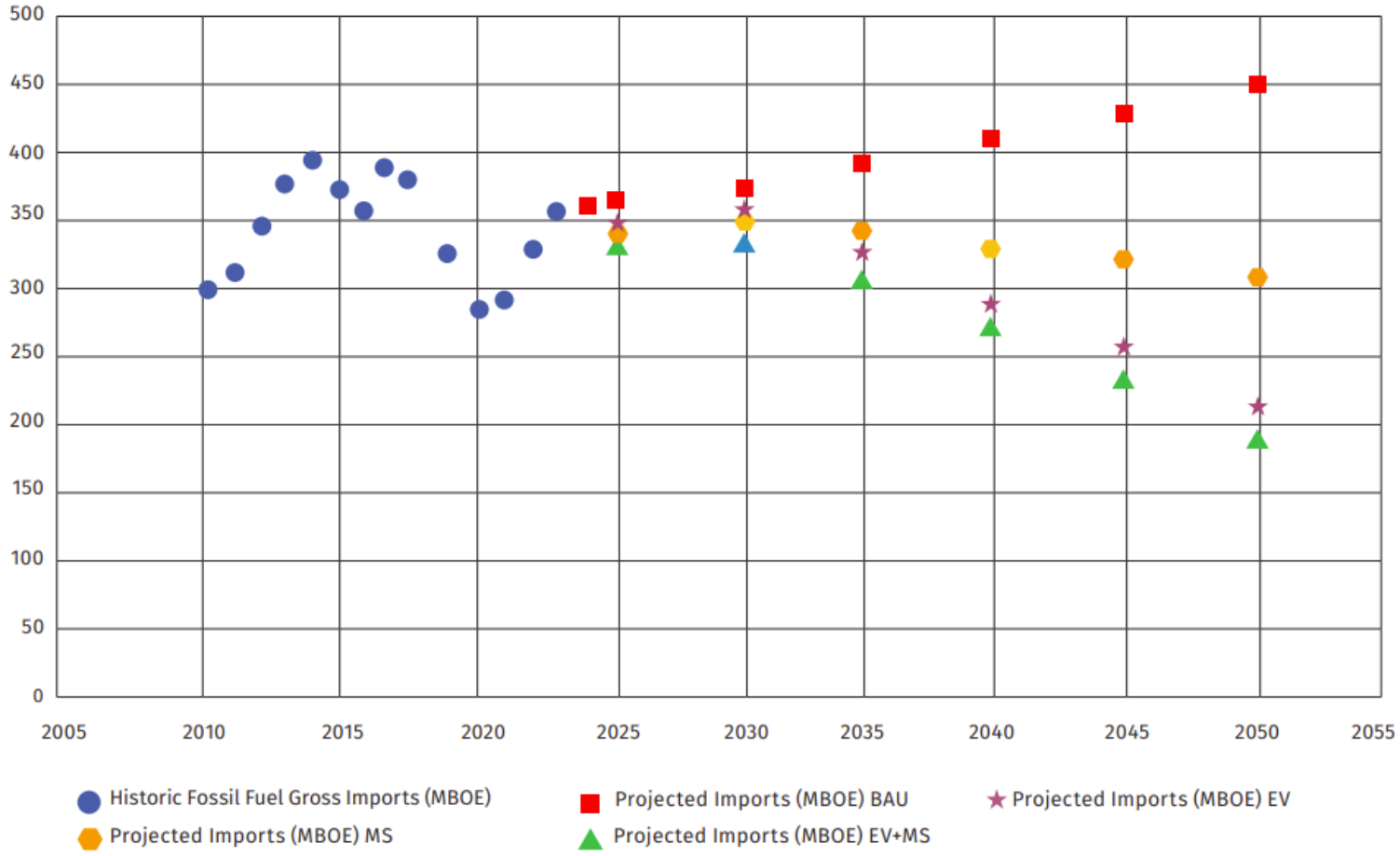
	2035 Projected Change in Imports from BAU				2050 Projected Change in Imports from BAU			
	BAU	EV Scenario	MS Scenario	EV+ MS Scenario	BAU	EV Scenario	MS Scenario	EV+ MS Scenario
Brazil	-	-14%	-13%	-22%	-	-46%	-26%	-51%
China	-	-3%	-5%	-7%	-	-9%	-7%	-11%
India	-	-4%	-4%	-6%	-	-15%	-10%	-17%
Indonesia	-	-17%	-13%	-23%	-	-51%	-32%	-57%
Mexico	-	-11%	-9%	-16%	-	-32%	-17%	-34%
United States	-	-10%	-10%	-16%	-	-29%	-13%	-30%
6 Country Total	-	-6%	-7%	-10%	-	-19%	-11%	-21%



A combined electrification and mode shift approach **could reduce gross oil and gas imports by 11% to 57% by 2050** (country dependent), **reducing annual imports by ~2.5 billions of barrels of oil** (equivalent)

Other Takeaways

Indonesia's Fuel Import Demand Forecast (MBOE)



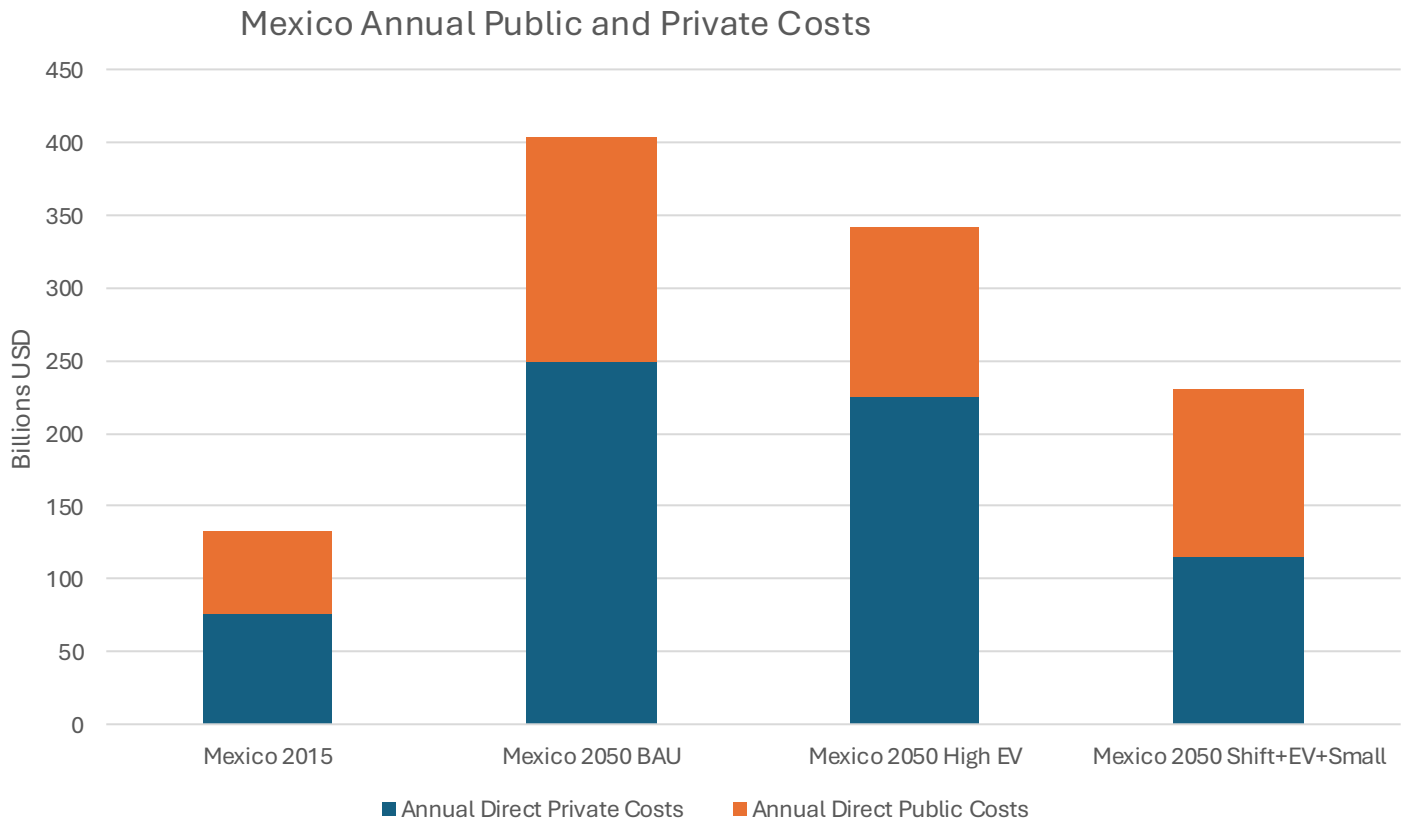
Indonesia shows the highest potential reduction in oil and gas imports from electrification and mode shift policies, with more than a 50% reduction by 2050.

Other Takeaways

- EV + Mode Shift measures can reduce energy consumption by ~70% and **reduce liquid fuel demand by 85%** by 2050 in urban passenger transport.
- This scenario **reduces exposure to future energy crises**
- In contrast, **fuel subsidies increase vulnerability to energy crises.**
- **Transport electrification is more affordable than ever**. Battery costs have fallen by more than 90% since the early 2010s.

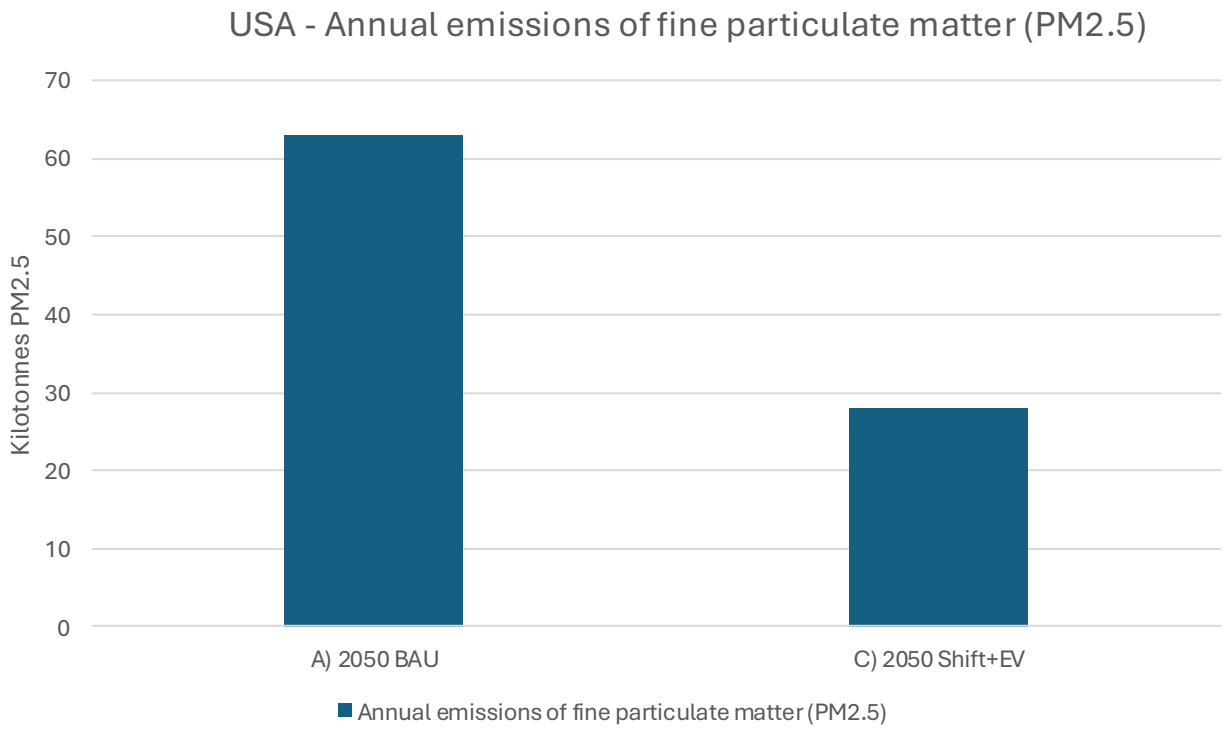
Other Takeaways

Direct public and private costs are projected to increase by an order of magnitude in countries such as India, Mexico, and China



Other Takeaways

High EV and **Mode Shift** can dramatically reduce local air pollution



Policy Conclusions

1. Investing in mode shift policies and EVs now has exponential benefits in the future, especially for energy security and economic impacts.

2. Greatest benefit from combining mode shift and electric vehicle strategies.

3. Other benefits include:
    - Improved air quality
    - Less congestion
    - Improved access to jobs and opportunities
    - Increased road safety
    - Reduced urban noise
    - Better social health

Thank You! Questions?



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